with minimal contamination of the peritoneal cavity that do not require resection. At present we feel the six hour "golden" period should be observed and that primary closure is certainly questionable after that time. In addition, antibiotics should be administered immediately after injury, during operation and postoperatively to reduce morbidity and mortality. Extraperitoneal rectal wounds still require a proximal diverting colostomy and appropriate drainage. Other factors arguing against primary closure are the presence of multiple associated injuries and a poor-risk patient in whom the operation would be prolonged by primary closure. When the above criteria cannot be met, the colon should be closed and exteriorized over a glass rod if possible. This is preferable to colostomy. If an uncomplicated course ensues, the colon can be returned to the abdomen in 10 to 14 days.

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Marginal Ulcer

MARGINAL ULCERS occur in 3 to 10 percent of patients in whom operations are done for duodenal ulcer. The ulcer recurrence rate after specific operations is widely variable: 34 percent after simple gastroenterostomy, 2.5 to 25 percent after vagotomy and pyloroplasty, 0.5 to 15 percent after gastric resection, and 0 to 1.8 percent following vagotomy and gastric resection. Most ulcers occur within two years of the initial procedure although the interval may be longer following gastroenterostomy.

Incomplete vagotomy is the most common cause of marginal ulcer, but other important etiological factors include retained antral mucosa following Billroth II gastric resection, unrecognized hyperparathyroidism and hypergastrinemia (Zollinger-Ellison syndrome). Clinical features of a marginal ulcer include pain (especially when located in the left upper quadrant), occult bleeding and sudden weight loss. Diagnostic tests should include endoscopy, barium upper gastrointestinal series, determination of basal acid secretion and serum calcium and gastrin determinations. A technetium scan may be useful if retained antral mucosa is suspected.

Surgical treatment of marginal ulcers is recommended and consists of completing the vagotomy and resecting the distal portion of the stomach if that has not been done previously. If hyperparathyroidism is present, it should be treated before further gastric procedures because parathyroidectomy alone may cure the marginal ulcer. A total gastrectomy should be done if hypergastrinemia is present because it is the most effective treatment for Zollinger-Ellison syndrome.

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Diagnosis of Venous Thrombosis—A 1976 Update

ALTHOUGH NEWER and noninvasive methods for venous thrombosis detection are available, radiographic phlebography is still the standard procedure for definitive diagnosis of clinically significant venous thrombosis. Indications for other procedures derive from contraindications to and impracticality of radiographic phlebography.

Noninvasive methods, including Doppler ultrasound flow detection, electric impedance and strain gauge plethysmography are adequate for detection of complete obstruction of the femoral and popliteal veins. Detection of nonobstructive, mural thrombi is less reliable, and thrombosis limited to the calf veins may not be detected with these procedures. Noninvasive thrombosis detection may be used in pregnant patients, patients with allergy to contrast media and those refusing invasive procedures.

Radionuclide angiography requires intravenous isotope injection distal to the thrombosis site. It shows the anatomy of the venous system but the quality of images is in general inferior to those of radiographic phlebography. Therefore, indications for its use are limited to patients with contraindications to phlebography. Venous scan with large radiolabeled particles (^{99m}Tc albumin aggregated) is based on Anger Camera imaging and subsequent polaroid photography of images produced by labeled particle entrapment on clots after distal intravenous radionuclide particle injection. Leg veins, iliac veins, inferior vena cava

and lungs can be scanned simultaneously and this method is adequate for screening purposes and for definitive diagnosis when radiographic phlebography cannot be done.

Serial labeled fibrinogen uptake test utilizing ^{125}I-fibrinogen is available for detection of active thrombus formation. It is the method of choice for detection of active thromboses in patients with a history of venous disease and equivocal clinical signs of activity. It has also been used for monitoring the adequacy of anticoagulation therapy. Its safety in pregnant women has not yet been shown, nor does it differentiate between superficial and deep venous thrombosis or between intravascular and extravascular fibrin deposits. Consequently, phlebography or venous scan should be done in these instances to determine the exact location of fibrin deposits detected by the fibrinogen uptake test. No instances of hepatitis following the use of the test have been reported in the United States but two instances of hepatitis have been reported in Europe, and caution is advised when other than autologous fibrinogen is utilized.

In conclusion, the newer methods for thrombosis detection complement previously existing methods. Adequate knowledge of the indications and limitations of each will result in improved diagnosis and care for patients with venous thrombosis.

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Noninvasive Methods of Evaluating Carotid Circulation

THE INCREASING EFFECTIVENESS of both medical and surgical therapy in the prevention of stroke from extracranial cerebrovascular disease has given impetus to the development of simple, safe and reliable tests for assessing disease in the carotid vessels as a part of the general examination of patients at risk for stroke. The Doppler ophthalmic test and ocular pneumoplethysmography have through an accumulation and dissemination of experience proved to be of significant clinical usefulness in evaluating cases of patients with an asymptomatic carotid bruit, an episode of transient cerebral ischemia or other manifestations of cerebrovascular disease, or those in which cerebrovascular disease is suspected. The Doppler ophthalmic test identifies the presence of external carotid artery collaterals found to occur in more than 80 percent of patients with hemodynamically significant lesions of the internal carotid artery. This test requires only a relatively inexpensive Doppler ultrasonic flowmeter, and some familiarity with its use. The ocular pneumoplethysmograph measures central retinal artery pressure, as a reflection of internal carotid artery pressure, by using a sensitive transducer connected with tubing to the sclerae by a standard vacuum pressure.

Using these techniques, a physician can reliably evaluate the need for arteriography and can establish the appropriateness of a trial of antiplatelet medication (such as acetylsalicylic acid, dipyridamole, sulfinpyrazone) or the advisability of proceeding with operative therapy.

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Pancreatic Ascites

PANCREATIC ASCITES refers to the clinical entity in which there is massive ascites due to nonmalignant pancreatic disease. The cause of the pancreatic disease is alcoholism in most patients. The other common cause is blunt abdominal trauma, especially in children. The patient characteristically presents with recent weight loss, increasing abdominal girth and weakness. Most have some abdominal pain, mild or severe, but others have no pain. There may or may not be a history of acute pancreatitis before the onset of ascites. Typically these patients have ascites that responds poorly to salt restriction-diuretic regimens.

On physical examination, the typical patient appears chronically ill and evidence of recent weight loss and pronounced ascites is noted. The abdomen is generally not tender. Skin lesions resembling erythema nodosum may be found. They represent subcutaneous fat necrosis. Differential diagnoses include ascites due to cirrhosis, abdominal carcinomatosis and tuberculous peritonitis. Diagnosis depends on a high index of suspicion of the condition in patients with ascites, and a diagnostic paracentesis for fluid analysis. The ascitic fluid protein in cirrhosis is generally less than 2 grams per 100 ml, whereas in patients with pancreatic ascites it is frequently over 3